DRAFT 2, Revision 7/31/2001
MANAGEMENT OF NOAA SMALL BOATS
APPENDIX I - NOAA SMALL BOAT OPERATIONAL RISK MANAGEMENT

SECTION A. INTENT.

It is the intent of NOAA Small Boat Operational Risk Management to achieve the highest possible level of safety and environmental stewardship in boat operations through risk management. This program should assist in streamlining safety management structure, and foster a corporate culture which places emphasis on the ability of field personnel to attain the highest level of safety and environmental compliance through experience, education, and training.

SECTION B. BACKGROUND.

.01 Operational Risk Management is derived from the principles of risk-based decision making. Decisions based on an evaluation of risk involve a series of basic steps. Risk management can add value to almost any situation, especially boat operations, where the possibility exists for serious or catastrophic outcomes. The steps used to manage risk can be used at different levels of detail and with varying degrees of formality, depending on the situation. The key to using the process is in completing each step in the most simple, practical way to provide the information the Senior Field Manager, Program Manager, Responsible Person, or boat operator needs in order to develop and successfully implement individualized requirements to mitigate specific risks.

.02 The information about the possibility for one or more unwanted outcomes separates risk-based decision making from more traditional decision making. The consideration of possible losses for any set of stakeholders is unique to risk-based decision making. Possible losses may include harmful effects on safety and health or the environment, loss of life, property loss, degraded mission success, or reduced public support.

.03 Most decisions require information not only about risk, but about other parameters as well. These additional parameters can include such things as cost, schedule requirements, and public perception. In risk management, all of the identifiable factors that affect a decision must be considered.

.04 The process of analyzing risk focuses on organizing information

for logical understanding. The goal of the analysis is to help people make better, more logical choices without complicating their work or taking away their authority. A good decision made quickly is much better than a perfect decision made too late. Also, a good decision does not always result in a good outcome. The best we can hope for is to equip programs with good information based on a number of decision factors and the interests of stakeholders. On average, and over time, vessel safety policies and boat operations based on decisions made through this process should provide the best outcomes. They will also provide logical explanations for decisions when the outcomes are not favorable.

.05 Operational Risk Management is used in every day life without consciously thinking about the process. It follows then that Operational Risk Management exists on many levels. The Senior Field Manager, Program Manager, Responsible Person, or boat operator selects which level to use based upon the requirements of this Order, or the specific mission, situation, time available, or proficiency of personnel and assets.

.06 NOAA operates a diverse array of boats. The safe operation of each vessel is affected by the interaction of many unique factors. NOAA Small Boat Operational Risk Management is designed to facilitate development of vessel operational standards based on an analysis of risk factors, and current standards of marine safety information and regulation.

.07 NOAA Small Boat Operational Risk Management is a participatory process between the Senior Field Manager, or their designee, and the OMAO Small Boat Coordinator. The Senior Field Manager provides an evaluation of unique risk factors and the characteristics of vessel operations. The OMAO Small Boat Coordinator evaluates this information, and in consultation with the Senior Field Manager, develops applicable safety and operational standards to be incorporated in a Vessel Operations Manual or Program Vessel Policy.

SECTION C. RESPONSIBILITY.

.01 OMAO Responsibility.

a. The OMAO Small Boat Coordinator is responsible for:

1. Assisting programs on an as needed basis in the risk assessment process.

2. Providing guidance in developing operational risk management standards.

3. Developing inspection requirements based on elements of the operational risk management plan, applicable marine safety standards, and prudent seamanship.

4. Managing a centralized database with an inventory of Class II and III motorboats and Small Research Vessels, including inspection standards and schedules, inspection results, corrective actions, and degree of compliance.

5. Providing regulatory interpretation, inspection services, and operator training resources support.

6. Maintaining the Small Boat Program web site content.

b. The OMAO Small Boat Engineer(s) is responsible for providing, to the extent that resources allow:

1. Motorboat procurement or acquisition assistance,

2. Development or review of motorboat repair or alteration specifications,

3. Contract oversight (COTR),

4. Advice or assistance to Senior Field Managers or Responsible Persons for any questions of a technical nature,

5. Electronics support or referral,

6. Design assistance,

7. Motorboat life cycle management assistance, and

8. Assisting the Small Boat Coordinator in maintaining the Small Boat Program web site content.

NOTE: Assistance and Costs. OMAO will, upon written request by the Senior Field Manager to the OMAO Small Boat Coordinator, provide technical assistance to achieve required standards. Programs may be required to bear associated costs for this service depending on the level of assistance required.

.02 Senior Field Manager Responsibility. NOAA Senior Field Managers shall:

a. be responsible for all aspects of small boat operations.

b. ensure each boat owned, operated, or under their direct organizational control is assigned to a Responsible Person(s).

c. designate each Responsible Person in writing.

d. evaluate each small boat with respect to the criteria listed in Section E of this Appendix, and submit this evaluation to the OMAO Small Boat Coordinator.

e. ensure compliance with the resultant standards derived from the operational risk management plan.

f. develop a comprehensive written Vessel Operations Manual for each motorboat, Class II or larger, under their area of responsibility.

g. develop a written Program Vessel Policy applicable to all vessels operated by the program. A sample Program Vessel Policy is attached to this Order as Appendix II.

h. determine additional operator training requirements.

i. retain the ability to delegate duties, authority, or routine responsibility, not specifically assigned to the Responsible Person, at their discretion. Senior Field Managers shall, at all times, retain the ultimate responsibility for the safe operation of boats regardless of any delegation of duty, authority or responsibility.

.03 Responsible Person. The Responsible Person shall:

a. have the authority, and access to resources, to enable compliance with this Order,

b. have the sole authority to decide the operational status of each boat(s) under their purview,

c. prepare prioritized operational budgets for each boat(s) under their purview.

d. identify and correct safety issues,

e. seek advice, when required, from the OMAO Small Boat Coordinator or OMAO Small Boat Engineer(s) for any matter related to safety, engineering, or regulation.

SECTION D. TIMING.

.01 Programs shall perform a review of the risk assessment criteria and subsequent mitigation techniques for each Class II and larger motorboat when:

a. A significant change in operations will occur, or

b. On the three year anniversary from the date of the current Vessel Operations Manual.

The Senior Field Manager shall forward one copy of the revised Vessel Operations Manual to the OMAO Small Boat Coordinator if changes are made to the manual.

.02 Programs shall perform a review of Program Vessel Policy, risk assessment criteria, and subsequent mitigation techniques, for all boats, when:

a. A significant change in the planned operations of Class A or I motorboats occurs, or

b. On the three year anniversary date of the current Program Vessel Policy.

The Senior Field Manager shall forward one copy of the revised Program Vessel Policy to the OMAO Small Boat Coordinator if changes are made to the policy.

SECTION E. PROCEDURES.

.01 Programs shall provide a written operational synopsis and an evaluation of the criteria listed in Section F for each Class II and larger motorboat. The evaluation shall be forwarded to the OMAO Small Boat Coordinator.

.02 The OMAO Small Boat Coordinator will review the submitted evaluation for each Class II and larger motorboat, and SRV. The Small

Boat Coordinator will provide guidance and advice to aid the Senior Field Manager in developing a customized vessel handbook of operational standards, required or recommended safety equipment, inspection guidelines, and inspection schedules.

.03 Programs shall evaluate the operation of all vessels within the framework of existing marine policies promulgated by:

a. local authority (for example, county or parish, municipality, or city regulations),

b. State authority (for example NJ Department of Environmental Protection),

c. NOAA,

d. Department of Commerce, and

e. Federal Government,

as well as the criteria listed in Section F of this Appendix. The results of this evaluation shall be used to establish a comprehensive written Vessel Policy for issues common to all boats operated by the Program. Appendix II of this Order is an example of a Vessel Policy written by, and for, Florida Keys National Marine Sanctuary, which may be used as guidance.

SECTION F. OPERATIONAL RISK MANAGEMENT.

.01 Principles of Risk Management.

a. Accept risk when benefits outweigh costs. Risk is inherent in boat operations. Risk is also related to gain; normally greater potential gain requires greater risk. The goal of ORM is not to eliminate risk, but to manage it so that mission can be fulfilled with the minimum amount of exposure to potential harm or loss.

b. Accept no unnecessary risk. Only take risks which are necessary to accomplish a mission. Taking unnecessary risks not related to successful mission completion is equivalent to gambling. Gambling is an imprudent activity which does not belong in operational risk management.

c. Anticipate and manage risk by planning. Risks are more easily

controlled when they are identified early.

d. Make risk decisions at the appropriate level. Risk-based decisions are made directly by the person in charge of a specific operation, boat, or activity at a given time. Prudence, experience, judgement, intuition, and situational awareness of the person in charge of a specific operation, boat, or activity at a given time are critical elements in making effective risk management decisions. When the person in charge of a specific operation, boat, or activity at a given time determines that the risk associated with their decision cannot be controlled at their level, or is not in accordance with the Senior Field Manager s operational intent, the decision must be elevated to the next level of supervision.

.02 Risk Management Process. Risk Management entails a process of identification, ranking, abatement, communication, and supervision of risks and associated controls.

a. Identification.

1. Potential hazards are first identified and must include potential dangers to:

(a) Personnel;

(b) Vessel;

(c) Environment; and

(d) Mission success.

Identified hazards are later ranked according to the severity and probability of occurrence.

2. Typical Causes. The following are common causes of injury or accident for boats. Causes must be considered in the risk identification phase in order to develop and implement logical and cost effective risk control measures.

(a) Human Systems Failure;

(b) Structural Failure;

(c) Mechanical/Systems Failure;

(d) Collision;

(e) Allision;

(f) Fire;

(g) Inadequate Stability;

(h) Grounding; and

(i) Hazardous Material Reactions;

3. Contributing Factors. The following is a list of contributing program or vessel-specific factors which must be considered when determining risk hierarchy rankings for identified hazards:

(a) Vessel Design Limits;

(b) Repair Standards;

(c) Stability Tests/Reports;

(d) Emergency Drills;

(e) Safety Systems;

(f) Operator Qualifications;

(g) Night Operations;

(h) Proximity or Probability of Emergency Assistance;

(i) Embarked Personnel;

(j) Staffing Levels;

(k) Management and Funding;

(l) Inspection Suitability;

(m) Material Condition;

(n) Nature of Operations;

(o) Operating Environment; and

(p) Safety Record.

b. Ranking.

1. Hazard Severity. The following is a classification of hazard severity and is intended to assist in developing a risk hierarchy.

(a) Category I - The hazard may cause death, complete loss of boat or gear, severe or irreparable damage to the environment, and result in great loss of trust or support from any group of stakeholders.

(b) Category II - The hazard may cause severe injury, chronic illness, substantial property or environmental damage, temporary loss of boat use, and result in a loss of trust from any group of stakeholders.

(c) Category III - The hazard may cause minor injury or property damage, temporary damage to the environment or a boat, and result in a loss of trust from a group of stakeholders.

(d) Category IV - The hazard presents minimal threats to personal safety, property, or health and will result in decreased mission accomplishment or represents inefficient use of Government resources.

2. Hazard Probability.

(a) Category A - Likely to occur in time, or repetitively over time. Expected to occur frequently to a person or item of property, or continuously throughout the small boat user community.

(b) Category B - Probably will occur in time. Expected to occur several times to an individual person, item, or frequently to the small boat user community over time.

(c) Category C - May occur in time. Can reasonably be expected to occur some time to an individual person, or item, or several times to the small boat user community over time.

(d) Category D - Unlikely to occur to any person, or item over the period of one year. May occur within the small boat user community rarely over time.

3. Risk Hierarchy.

(a) Ranking hazards in terms of severity leads to the development of more informed and cost effective risk control measures. In determining the rank of a particular hazard, the hazard severity and probability are evaluated to arrive at a relative risk ranking. A relative ranking for each hazard based on the following matrix should aid in compiling a risk hierarchy. A Risk Hierarchy rating of 10 represents the greatest risk, a rating of 1 represents the least risk.

Risk Hierarchy					
	Hazard Probability				
Hazard Severity		A	B	C	D
	I	10	10	9	8
	II	9	9	7	6
	III	8	7	4	3
	IV	6	3	2	1

(b) In some cases, the worst credible consequence of a hazard may not correspond to the highest ranking for that hazard. For example, one hazard may have two potential consequences. The severity of the worst consequence (I) may be unlikely (D), resulting in a ranking of 8. The severity of a lesser consequence (II) may be probable (B), resulting in a raking of 9. Therefore, it is also important to consider less severe consequences of a hazard if they are more likely to occur than the worst consequence of a hazard since the more likely occurrence may present greater overall risk.

c. Abatement. After identifying and ranking risk, possible control measures are considered. Control measures are implemented based on applicable regulation, lessons learned, mission impact, cost, effectiveness, and prudent seamanship. Control measures shall be written and form the basis for Vessel Operations Manuals and Vessel Policies. An example of policy derived from abatement measures could appear as a written policy, for example, prohibiting drugs and alcohol

aboard Government vessels, or requiring personal floatation devices (PFD) while working near or over the side of a boat. Other results of abatement procedures could require specific outfitting with respect to safety gear such as EPIRBs (emergency position indicating radio beacon), PFDs, or GMDSS (global maritime distress and survival system) approved electronics. Abatement measures could also entail developing policy for administrative procedures such as requiring procurements based on best value instead of low bid.

d. Communication. Risks for which no method of abatement or control are available, or for which a method of control or abatement would be impractical for reasons of adverse impact on mission accomplishment, or insufficient benefit for cost, are controlled through communication of the risk. For example, working from a hero platform presents significant risk because personnel can easily fall overboard. Simple control measures would require wearing a PFD and/or a tether. There are many more risk abatement measures which could be used but would not be feasible due to cost or adverse impact on mission. Therefore identification, such as black and yellow hazard striping or signage can remind the person on the platform to mind their step. Communication serves the best means of reducing uncontrollable risk by reminding personnel of the innate hazards of certain activities.

Note: It is important to recognize that not all risk is bad. In conducting daily operations a certain amount of calculated risk is necessary for a program to remain dynamic or focused on goals and operational needs. In the most general and extreme sense, setting foot on board a small boat constitutes taking a risk. It is the goal of NOAA Small Boat Operational Risk Management to make the inherent risks associated with operating small boats reduced, calculated, or at least identified and communicated.

e. Supervision.

1. Boat operations must be monitored by the boat operators, Responsible Person, Program Manager, and Senior Field Manager for any changes which may present new hazards or which may cause current abatement measures to become ineffective or unreasonable.

2. Controls or abatement measures which have become ineffective must be adjusted or the risk must be re-evaluated for immediate implementation of proper controls.

3. When particular risk reducing practices or boat design and outfitting are extremely effective or result in increased

operational efficiency, it should be shared with the small boat user community through inclusion on the Small Boat Program Website.

.03 Levels of ORM. There are several levels of Operational Risk Management which are used depending on the specific mission situation or program requirements. These levels are:

a. Time-Critical - An on the run mental or oral reviewfo situational parameters using the process outlined in Section F.01, without creating a record of the process. This level of ORM is used by experienced personnel to consider risk while making decisions in a time-compressed situation. This is the normal level of ORM used during every day life. It is particularly helpful in choosing the appropriate course of action when an unplanned event occurs during normal operations, or an urgent response to a time critical situation is required. This process is used every day in the field during the normal course of operations.

b. Deliberate - An application of the ORM process in planning an operation or evaluating procedures. It primarily uses experience and brainstorming to identify hazards and develop controls, and is therefore most effective when done in a group. Examples of deliberate applications include planning of upcoming operations, review of standard operating, maintenance or training procedures and damage control/disaster response planning. Results of a deliberate application of the ORM will usually produce a record of the process. This process is utilized in Class A or I motorboat procurements or acquisitions.

c. In-Depth - A deliberate process with a more thorough risk assessment involving research of available potential hazard data, analysis of trends and developments in marine safety technology, and use of subject matter experts to identify and assess potential hazard mitigation criteria. This process level is utilized in developing individualized Vessel Operations Manuals and Program Vessel Policies and should be used for Class II and larger motorboat and SRV procurements or acquisitions.

.04 Hypothetical Risk Management Plan Development. The following text is an example of an operational synopsis, operational risk assessment, and subsequent Vessel Operations Manual based on a brief description of a fictitious motorboat. This example is not a complete assessment of all risks or all attributes. It is intended to provide general guidance to assist the Senior Field Manager in developing

individualized Vessel Operations Manuals.

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EXAMPLE HYPOTHETICAL RISK ASSESSMENT

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OPERATIONAL SYNOPSIS:

The Research Vessel ZENITH SAFETY, a 41 foot ex-USCG aluminum hulled utility boat, has been acquired by a NOAA program for use in the protected bays and sounds of Southeast Alaska. The vessel hull was surveyed prior to acquisition and thickness tests showed the hull to be sound. The vessel will operate in waters no greater than 5 miles from nearest land. The vessel can, and will, carry up to 5 persons, including the vessel operator for voyages up to 3 days away from port. The vessel was modified from the original USCG mission and is currently configured for fishing operations using bottom trawls. Modifications to the boat include the addition of a trawling winch and an aluminum frame structure on the aft section of the vessel which will be used as a towing point and a means to lift catch on to the vessel. Safe working loads for the modifications are not known and have not been calculated or tested. The vessel s trim and stability characteristics are known because of an inclining experiment performed following the fishing mission modifications. The vessel will cease operations and seek refuge each night in protected coves, or dock at small villages, because of restrictions on overtime compensation.

IDENTIFICATION AND RANKING OF RISKS

The following hazards exist for:

Personnel - exposure to cold water, attack by wildlife in remote areas, blunt trauma or skin piercing injuries consistent with fishing operations in general, incapacitating injury caused by failure of fishing modifications.

Vessel - capsizing or swamping due to net hangs or marginal stability encountered during lifting of heavy loads or icing. Machinery and equipment failure, fire, collision, allision.

Environment - accidental discharge of fuel or any product capable of producing a sheen upon the water. Current diesel main propulsion engines do not meet IMO requirements for reduced NOX emissions. Unintentional discharge of trash caused by wind or seas.

Mission - destroyed gear or lost instruments due to hangs or obstructions, lost time due to machinery failure.

The hazard severity and probability criteria and risk hierarchy matrix were used to determine the relative hazard ranking below. The hazard severity and probability are listed as a parenthetical remark after each hazard. For example, (II-B) would indicate a hazard which is likely to cause serious injury or temporary loss of boat use and will probably occur over time. The ranking is based on a scale of 1 to 10. A value of 10 presents the greatest risk. The list is presented in order of decreasing risk with the greatest risk presented first:

Structural Failure (I-B) - Risk hierarchy ranking 10, modifications to the vessel to accommodate the fishing mission had not been reviewed by a qualified marine engineer. Load tests have not been conducted on the aluminum fishing structure. Trawl winch mounts have not been tested to a known safe working load.

Allision (II-B) - Risk hierarchy ranking 9, wooden debris in the form of large trees and ice bergs are commonly found adrift in the planned operating area. These obstructions generally float slightly above or near the surface of the water making detection and avoidance difficult.

Man Overboard (I-D) - Risk hierarchy ranking 8, the risk of a man falling overboard is slight due to the placement of adequate hand rails and toe rails around the vessel included as part of the prior use of the vessel by the USCG. However, due to the cold water environment of Southeast Alaska, the consequence of this hazard raises its hazard ranking.

Grounding (III-B) - Risk hierarchy ranking 7, Shallow rocky reefs exist throughout the area, however most are well marked. The more likely cause of unintentional grounding would occur due to the inability to anchor prior to becoming grounded. This situation is common in southeast Alaska due to the steepness of the bathymetry close to land.

Stability (II-D) - Risk hierarchy ranking 6, The vessel stability characteristics have been changed from the original design due to the addition of the weight of the trawl frame and winch on the after deck. The inclining experiment and resultant trim and stability booklet will allow the operator to make informed decisions regarding the operation of the vessel in varying conditions of loading. However, fishing operations present unique hazards in that unknown weights or

unanticipated forces may act to upset the vessel. The dangerous nature of fishing operations combined with the possibility of the vessel taking additional weight above the water line due to icing adds to the potential capsizing hazard.

Collision (II-D) - Risk hierarchy ranking 6, Common vessel traffic include ferries, cruise ships, tugs towing barges, fishing vessels, fast excursion and sight seeing vessels, and occasional recreational traffic. In general, few vessels will be encountered in the intended operating area. Restricting operations to daylight hours further reduces the risk of collision.

Fire (II-D) - Risk hierarchy ranking 6, the vessel is aluminum hulled with adequate fire extinguishing capability remaining from prior USCG outfitting. Use of combustible materials are limited. The vessels machinery spaces and bilges are maintained free of grease and oil.

Hazardous Material Reactions (II-D) - Incompatible, or reactive, chemicals are identified and kept in separate compartments. Oily rags are disposed of in an air tight metal container. Chemicals used to preserve biological samples are removed after each cruise. An accurate and up-to-date inventory of Material Safety Data Sheets are maintained aboard the vessel.

Human Systems Failure (III-D) - Risk hierarchy ranking 3, The Senior Field Manager in charge of the laboratory has implemented an extensive training program. Certified boat operators have many years of experience in the operations area and have maintained an impeccable safety record. Any issues pertaining to vessel safety are addressed or corrected immediately. However, even though all persons aboard the vessel are highly skilled, cramped quarters, long work hours, and noise contribute to crew fatigue and increase the potential for accidents. Although the probability of a hazard caused by human systems failure is very low due to excellent training, experience, and management, the severity of the consequences of human systems failure (human error) are generally high.

Mechanical/Systems Failure (IV-C) - Risk hierarchy ranking 2, the vessel had been maintained and operated by the USCG. A maintenance service contract with a local marine repair company is utilized to maintain engineering systems. Therefore, all systems were maintained and continue to be maintained in excellent condition by strict adherence to a preventive maintenance schedule. Boat operators are familiar with common signs and symptoms of system weakness or disrepair and report their concerns directly to the marine engineering

contractor.

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END OF EXAMPLE HYPOTHETICAL RISK ASSESSMENT
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.05 Vessel Operations Manual.

a. A sample Vessel Operations Manual, intended to formally implement specific hazard controls for items identified in the previous hypothetical risk assessment, is given below. Senior Field Managers or Responsible Persons should use common sense in developing the majority of the information in this manual. Guidance and input from the OMAO Small Boat Coordinator may be provided to assist Senior Field Managers in developing specific risk abatement requirements or procedures.

****
SAMPLE VESSEL OPERATIONS MANUAL
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Research Vessel ZENITH SAFETY
VESSEL OPERATIONS MANUAL

Operations Area

The vessel is to be operated in the protected bays, sounds, straits, and channels of Southeast Alaska. Operations in waters beyond this general area are not advised, however if operated in open waters beyond the protected areas, special attention shall be given to anticipated weather and distance to a safe harbor of refuge.

Weather

At a minimum weather forecasts shall be monitored by all available means as follows; at least every 8 hours, or in the case of impending foul weather as often as forecast updates are issued. In all cases involving underway mission decisions, the Responsible Person or operator(s) of the R/V ZENITH SAFETY shall determine whether or not an operation will be delayed or cancelled due to weather events.

Material Condition

In order to maintain the material condition of the aluminum hull the operator of the R/V ZENITH SAFETY is urged to keep all bilges clean

and dry at all times. Furthermore, special attention must be paid to the introduction of dissimilar metals aboard the vessel. For example, a penny or copper wire clippings dropped in the bilge can corrode a hole through the hull in a relatively short period of time. The fiberglass cockpit enclosure of the vessel requires periodic attention through wash down and occasional cleaning and polishing. The attachment of the fiberglass house to the hull should be periodically examined for signs of corrosion. All fishing apparatus and through hull fittings must be visually examined at least monthly for signs of wear, corrosion, strain, cracking, or potential failure. Use of plain steel bolts, nuts, pipe fittings, hose clamps, or other appurtenances are strongly discouraged. Instead, type 316 stainless steel should be used where possible. Any issue which may be beyond the scope of in house knowledge or experience shall be brought to the immediate attention of Robbie s Marine Service for correction as soon as practicable. Robbie can be reached at 609-555-4801.

Repair Standards

Due to the susceptible nature of aluminum hulled vessels to galvanic corrosion, special attention must be given to repair or modifications to the R/V ZENITH SAFETY. In particular the use of dissimilar metals on board the vessel must be minimized and, if used, kept electrically isolated from the hull of the vessel. Electrical modifications to the vessel must account for the special nature of wiring installations aboard aluminum hulled vessels. Any work to be performed on the vessel must be in accordance with American Boat and Yacht Council Standards and Recommended Practices for Small Craft. If in doubt as to the adequacy or compliance of a proposed repair or alteration, the Responsible Person is urged to contact either Robbie, of Robbie s Marine Service (609-555-4801) or the OMAO Small Boat Engineer.

Any modification to the vessel which requires additional lifting or hoisting capacity or involves the cumulative redistribution of greater than 2% of the vessel s displacement tonnage is required to be reviewed by the OMAO Small Boat Engineer. A weight record or log shall be maintained in order to ensure an accurate record of weight movements, additions, or deletions from the vessel. A running total (sum) of all weights shall be kept current. The 2% weight threshold shall be calculated from the boat s original displacement weight from the most current trim and stability data. The 2% threshold shall be conspicuously written on the top of each page of the weight record or log when a new page is started.

Stability

Operation of the vessel shall be within the guidelines set forth by the *Trim and Stability Booklet for the R/V ZENITH SAFETY*. Extreme caution must be exercised by the operator when icing conditions are possible.

Emergency Drills

Emergency drills shall be conducted at least quarterly and shall include responses to fire, flooding, abandon ship and man overboard emergencies. At least annually, all field party members shall be trained in cold water and wilderness survival techniques, and in the use of fire arms.

Safety Systems

Prior to departure on any project, all personnel shall be briefed by the vessel operator on the location and operation of all emergency equipment. At a minimum, all personnel shall know the location and operation of the vessels GPIRB (emergency position indicating radio beacon with GPS position included in distress message), SART (search and rescue transponder), life raft, survival radio, flares and other signaling devices, and immersion suits. Float plans shall be submitted in accordance with NAO 217-103. During multiple day projects when the vessel is away from the home port, daily position and operational update reports must be communicated to a contact on shore.

Operator Qualifications

The following personnel are qualified to operate the vessel on any project in accordance with this manual:

Susan Scientist	Frank Fish	Paul Porpoise
Tina Trout	Samantha Shrimp	Bob Buoy
Sal Salmon	Dave Daybeacon	Regina Radar

Susan Scientist is designated as the Responsible Person for R/V ZENITH SAFETY in accordance with NAO 217-103 Management of NOAA Small Boats. Certification of and qualification criteria for potential operators of the R/V ZENITH SAFETY is delegated to, and managed by, Susan Scientist. Certification involves successful completion of a web-based training course, proficiency in hands-on boat handling skills, and demonstration of basic engineering systems trouble shooting. Contact Susan Scientist for specific certification details.

Night Operations

Night operations, although not practiced, are authorized. The boat operator is specifically cautioned to the special hazards of operating the vessel at night. Specifically, the hazard of collision with floating debris such as logs or icebergs requires special consideration. A dedicated lookout is strongly recommended during night operations and is required during transits when the vessel is operating above 5 knots. The vessel searchlight must be in working order to conduct night operations.

Proximity or Probability of Emergency Assistance

Although Southeast Alaska is remote and hazardous, all operations conducted by the R/V ZENITH SAFETY will be within reasonable range of USCG emergency assistance. The vessel should not be operated beyond range of USCG air rescue without prior planning.

Embarked Personnel

At no time shall the vessel carry more than a total of six persons on any scientific operational mission. At no time may the vessel carry more then 8 persons on board. Personnel embarked aboard the vessel not in the direct employment of NOAA are required to sign a waiver for the release of liability. NOAA Administrative Order 217-106 contains policy regarding transportation of non-NOAA personnel aboard government vessels. Although the intent of the Order addresses personnel aboard NOAA ships, aircraft, and/or motor vehicles, the policy is applicable to small boats and the intent of the Order shall be followed.

Staffing Levels

When operating the vessel for 12 hours or less, one certified operator is required. For projects requiring multiple and concurrent operational days, two certified operators are required. When VIPs or other observing personnel are embarked aboard, an additional operator is required beyond that stated above.

Nature of Operations

The R/V ZENITH SAFETY is currently configured for near coastal, less than 20 miles from shore, fisheries research. Any significant change in the proposed nature of operations for this vessel, such as diving, will require additional planning and special considerations.

Operating Environment

The R/V ZENITH SAFETY operates in Southeast Alaska. Hazards unique to this environment include bears, extremely cold water, rapidly and frequently changing weather conditions, poor radio and cellular phone communications due to mountainous terrain, and swift tidal currents sometimes in excess of 8 knots.

Required Safety Equipment

1 Category 1 GPIRB
1 Mini-B EPIRB
1 Search and Rescue Transponder (SART)
1 10-person capacity SOLAS approved, A Service, life raft
3 SOLAS approved orange smoke distress signals
3 SOLAS approved red rocket parachute flares
1 First Aid kit
1 Wilderness survival kit including matches, fire starting paste, and bear deterrent.
1 GMDSS approved handheld VHF survival radio
2 24" life rings
1 Rescue heaving line
1 Anchor and 250' anchor line with at least 20' of 3/8" chain and swivel between anchor and line.
2 Baseball bats (seasonal requirement, ice removal)

Required Navigation Equipment

Magnetic Compass with current deviation card
GPS interfaced with Electronic Charting
RADAR, 12 mile or greater
Search light
Nautical charts maintained to current Notice to Mariners
Binoculars

Required Communications Equipment

2 VHF radios
1 HF radio
1 Cell phone
1 Satellite phone

R/V ZENITH SAFETY Underway Check-off List

PRIOR TO DEPARTURE

_____ Float plan given to shore side contact.

_____ Top off potable water tank

_____ Empty marine toilet holding tank

_____ Adequate number of PFDs, Mustang suits, or float coats aboard.

_____ Inspect/test GPIRB for proper operation

_____ Inspect/test SART for proper operation

_____ Check fuel levels, record amount in log.

_____ Open all sea chests sea cocks and necessary sea valves

_____ Check oil, coolant, belts, and hoses for:

- _____ Port main engine
- _____ Starboard main engine
- _____ Generator
- _____ Marine gear(s)/transmission(s)

_____ Start main engines and generator

_____ Check for cooling water discharge

_____ Check oil pressures

_____ Check generator is warmed, shift to generator power

_____ Take in or unplug land line and shore tie

_____ Turn on and check all wheelhouse electronics for proper operation

_____ Check main engines are warmed, test ahead and astern propulsion

_____ Test steering

_____ Cast off lines

AFTER ARRIVAL

_____ Make mooring lines fast

_____ Secure main engines

_____ Secure all electronics and electrical loads

_____ Hook up shore tie and land line

_____ Shift to shore power

_____ Secure generator

_____ Notify personnel listed on float plan of arrival

_____ Disembark and go home

****

END OF SAMPLE VESSEL OPERATIONS MANUAL

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b. This example is by no means comprehensive or inclusive of all particulars or aspects of specific NOAA owned small boats. Additional information and appendices can or may be included with vessel specific information regarding scheduling, approved repair facilities, operator training criteria and skills demonstration, research permits, maintenance logs, VHF radio station license, vessel documentation, copy of EPIRB registration, or other information deemed necessary by the Responsible Person or Senior Field Manager.

.06 Program Vessel Policy.

A sample Program Vessel Policy, based on the Florida Keys National Marine Sanctuary, is attached to this Order as Appendix II. Senior Field Managers, or Responsible Persons, are encouraged to borrow from the FKNMS Vessel Policy and make changes where necessary. Additional guidance in the form of sample Vessel Policies are available for viewing and download on the Small Boat Program Web Site.

.07 Grievance Resolution.

a. If a disagreement should arise during the development of a Vessel Operations Manual between a Responsible Person and the Senior Field Manager concerning the inclusion or omission of specific risk or safety related content, either party may have the issue reviewed by the OMAO Small Boat Coordinator. The OMAO Small Boat Coordinator shall act as a mediator in such a dispute. After consideration of both parties arguments, a uniform resolution developed within the framework of applicable safety and regulatory intent shall be reached by the OMAO Small Boat Coordinator.

b. If a disagreement should arise between a Program Manager or Responsible Person and the OMAO Small Boat Coordinator during the development or approval of a Vessel Operations Manual, either party may have the issue reviewed by a mutually agreed upon third party expert in the field of Marine Safety or by the Small Research Vessel Committee. After consideration of both parties arguments, a uniform resolution developed within the framework of applicable safety and regulatory intent, shall be reached by the third party expert or Small Research Vessel Committee and shall be final.

SECTION G. SMALL RESEARCH VESSEL COMMITTEE.

.01 Purpose. The Small Research Vessel Committee shall be responsible for:

a. developing uniform resolutions to grievances within the framework of applicable safety and regulatory intent as described in Section E.07b above,

b. meeting as directed by the Director, NOAA Corps, or Line Office Deputy Assistant Administrator for the purpose of reviewing advances in marine safety technology or changes in regulatory standards as they may apply to, or impact upon, NOAA small boat operations,

c. mandating changes to the Small Boat Program Website based on field activity input,

d. reviewing and disseminating lessons learned from casualties either within NOAA or within the professional maritime community which are relevant to the nature of small boat operations within NOAA, and

e. other appropriate small boat duties as assigned by any Deputy Assistant Administrator or higher authority, or the Director, NOAA Corps.

.02 Membership.

a. The Small Research Vessel Committee shall be composed of eight members as follows:

1. OMAO Small Boat Coordinator (Chair);

2. OMAO Fleet Inspector;

3. OMAO Small Boat Engineer;

4. OAR Representative (1);

5. NOS Representatives (2); and

6. NMFS Representatives (2).

b. Members shall be actively involved in the operation of small boats and shall be recruited by the OMAO Small Boat Coordinator or volunteered by the Deputy Assistant Administrator of the respective Line Office and shall serve a one year term.

SECTION H. REFERENCES

The following references were used extensively in the development of this Appendix:

a. USCG Risk Based Decision Making Web Site, http://www.uscg.mil/hq/g-m/risk/index.html

b. OPNAVINST 3500.39A/MCO 3500.27A, INTRODUCTION TO OPERATIONAL RISK MANAGEMENT (ORM)